III. Regularity and Chaos in a Circular Cavity

A. The Integrable Case: Effect of the Inhomogeneity

- Conditions of integrability and different profiles

B. The Non-Integrable Case

- The KAM scenario recovered (with symmetries)
- Some examples

IV. Symmetry and Degeneracy in an Inhomogeneous Circular Cavity

A. The Integrable Case: Effect of the Inhomogeneity

- Classification of different scenarios for breaking the rotational symmetry of the cavity and inducing chaotic behavior
- The stronger the inhomogeneity, the stronger is the effect on trajectories of smaller periods

B. The Non-Integrable Case

- Minimal effect until \( \varepsilon = 0.1 \)
- Maximal effect when \( \varepsilon > 1 \)

V. Refractive Escape in an Inhomogeneous Circular Billiard

- In one periodic orbit correspond many different trajectories
- The stronger the inhomogeneity, the strongest the refractive escape
- In period 4 to period 12

VI. Summary and Conclusions

- Introduction to the new class of billiards, the inhomogeneous billiard
- The stronger the inhomogeneity, the stronger the refractive escape
- Numerical simulations show that one periodic orbit correspond many different trajectories
- Minimal effect until \( \varepsilon = 0.1 \)
- Maximal effect when \( \varepsilon > 1 \)